barriers at the local level,[40] reliance on competition, not price regulation based on modeling, is the best way to drive prices to efficient levels. Moreover, such competition will develop in rural, as well as suburban and urban, areas.

D. Cost Proxy Models Should Not Be Used For Multiple Purposes

The Staff Analysis is justified in questioning whether a model can or should be used for multiple purposes.[41] In light of the limited utility of cost proxy models, the Commission should not compound potential errors or inaccuracies by endorsing or developing a purportedly all-purpose model. The Christensen Attachment demonstrates that there are serious methodological problems in attempting to doing so.[42] As the Staff Analysis notes, because a model designed for the purpose of developing cost proxies for universal service is limited to modeling costs for development of a relatively limited package of universal service capabilities, it should not be used for costing a much more diverse set of network elements or access services.

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40 *See* 47 U.S.C. § 253.

41 *See* Staff Analysis at para. 11.

42 *See* Christensen Attachment at 11-12.

E. The Hatfield 2.2.2 Model Is Seriously Flawed

On February 7, 1997, the latest release of the Hatfield model, version 3.0 ("Hatfield 3.0"), was filed with the Commission. USTA's members are in the process of reviewing the new version to determine how it addresses the various inadequacies of the previous version, Hatfield cost proxy model 2.2.2 ("Hatfield 2.2.2").

USTA has discussed at length the limitations of Hatfield 2.2.2.[43] Because Hatfield 2.2.2 is a case study of the flaws of a model that attempts to serve multiple purposes while failing to reflect reality, USTA briefly summarizes its concerns with that model. Hatfield 2.2.2 makes no attempt to estimate costs for service areas other than those of the Bell Operating Companies ("BOCs").[44] Because the areas served by smaller telephone companies are often the very ones with higher costs, this is a fundamental limitation of Hatfield 2.2.2. Further, the Hatfield model contemplates broad study areas, that do not permit the computation of results from areas falling below the prescribed size. Thus, Hatfield 2.2.2 cannot be used properly to identify specific high-cost areas.[45]

In addition, Hatfield 2.2.2 makes arbitrary default assumptions. Hatfield 2.2.2 assumes that structure sharing always occurs and that the efficient entrant will always incur one-third of

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[43] *See, e.g., Not the Real McCoy: A Compendium of Problems with the Hatfield Model, ex parte* filing of USTA, CC Docket No. 96-45 (Oct. 16, 1996) ("Not the Real McCoy").

[44] *See Economic Evaluation of Proxy Cost Models for Determining Universal Service Support*, Christensen Associates (Jan. 28, 1997) (filed as an addendum to USTA Recommended Decision Reply Comments) at 25.

[45] *See id.* at 10-12.

all structure-related costs.[46] There is no valid basis for these default assumptions. Second, as the Commission is well aware, the accurate allocation of overhead and fill factors is problematic even using the most comprehensive actual cost data available. Hatfield 2.2.2's arbitrary assumption of a 10% overhead factor is patently unreasonable.

As USTA and other commenters advised the Commission in the Interconnection proceeding, Hatfield 2.2.2 has been tested thoroughly and has failed to satisfy basic modeling design criteria.[47] Specifically, when tested using multiple data sets, wildly uneven outcomes resulted, particularly when disaggregated geographic areas are studied. The divergent and often unexplainable results produced by the Hatfield model confirm that its underlying algorithms are outcome dependent and cannot be relied upon to provide valid cost estimates.

Because Hatfield 2.2.2 makes no allowance for future growth in demand, the model underestimates costs by ignoring the fact that incumbent LECs and new entrants will invest in capacity for future growth.[48] For this reason, even if the engineering and economic assumptions of Hatfield 2.2.2 were correct, which they are not, the model would still fail to produce accurate cost estimates for the real world.[49] Thus, imposing rates based on cost

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[46] *See id.* at 13.

[47] *See* Consolidated Opposition of USTA to Petitions for Reconsideration, CC Docket No. 96-98 (filed Oct. 31, 1996) ("USTA Interconnection Opposition") at 12-13.

[48] *See* Not the Real McCoy at 14.

[49] *See generally* Price Technical Services, Inc. and Austin Communications Education Services, Inc., *Engineering Evaluation of Cost Proxy Models for Determining Universal Service Support: Hatfield Model 2.2, Release 2, ex parte* filing of USTA, CC Docket No. 96-45 (Feb. 5, 1997).

estimates produced by Hatfield 2.2.2 would be anticompetitive and contrary to the intent of the Telecommunications Act.

Moreover, to the extent that supporters of the Hatfield model claim that the problems with the model are being resolved,[50] the rapid succession of alleged "fixes" over the past year indicates that any version currently under consideration cannot be trusted with the important regulatory role that it could play under the assumptions of the Staff Analysis. Indeed, as USTA pointed out in the interconnection proceeding, the model's undocumented and inaccessible equations have a profound impact on its results.[51] These multiple flaws render Hatfield 2.2.2 unsuitable for any costing purposes, including those considered in the Staff Analysis.

F. Differences Between Accounting Costs And Model Results Are A Product Of Prior Regulatory Regimes

At several points, the Staff Analysis moves from examining the characteristics of cost proxy models to speculation regarding the causes for differences between the results of various models, on the one hand, and the ARMIS information reported to the Commission, on the other.[52] While USTA has not performed an exhaustive study of the underlying reasons for such differences, it seems clear that, at least in part, the Staff Analysis ignores the role of regulation in explaining such differences.

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[50] As noted above, Hatfield 3.0 was recently submitted to the Commission.

[51] *See* USTA Interconnection Opposition at 15.

[52] *See, e.g.*, Staff Analysis at paras. 13, 31, 63.

Contrary to the apparent thrust of the Staff Analysis, the effect of prior regulatory practices figures prominently among the possible explanations that the Staff Analysis presents for such differences. For example, the Staff Analysis states that underdepreciation of incumbent carriers' assets may have occurred because of unanticipated technological changes. Such reasoning glosses over the fact that incumbent LECs' depreciation rates have historically been subject to regulation, and that regulators have often established depreciation periods that are substantially longer than those used in a competitive setting that responds rapidly to technological change.[53/]

The Staff Analysis also speculates that "LECs may have engaged in systematic overinvestment or other non-cost-minimizing behavior."[54/] Incumbent LECs have not "overinvested." LECs' investments have been made pursuant to the oversight, and at times the mandate, of the FCC and state regulators in furtherance of the LECs' obligations to serve the public and their fulfillment of their obligations as carriers of last resort. For example, incumbent LECs have been, and will continue to be, obligated to provide for new growth. In contrast, a new entrant can choose to build only the capacity needed to serve a selected customer base, foregoing any consideration of future demand. Even if a new entrant underestimates or chooses not to provide for growth, incumbent LECs continue to be responsible for ensuring that adequate facilities are available. USTA is concerned over this

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53/ *See* Strategic Policy Research Paper at 2-4, 26.

54/ *See* Staff Analysis at para. 13.

lack of recognition of the effect of prior regulatory regimes on incumbent LECs' investment decisions.[55/]

G. The Staff Analysis Does Not Consider Technical Difficulties In Using Cost Proxy Models

Although USTA discussed the administrative difficulties of using cost proxy models in the universal service context, these difficulties are not even considered in the Staff Analysis. The Staff Analysis appears to assume that it would be a relatively simple process to substitute cost proxy models for cost studies by incumbent LECs. The fact remains, however, that company-specific data would have to be used to even begin to develop credible cost estimates from any model. Properly gathering, organizing, and validating such data -- which would be essential in using a cost proxy model -- would pose a monumental task for both the Commission and incumbent LECs.[56/] Moreover, the costing process requires multiple stages of analysis and preliminary studies that must be conducted before producing the input data needed for these models.

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[55] The Staff Analysis lists two other possible reasons for differences between ARMIS data and some model outputs: inaccurate modeling assumptions, and declining input costs. USTA agrees that certain models, particularly the Hatfield model, may fail to select investment levels that are sufficient to provide satisfactory levels of local telephone service. It is difficult to generalize about whether input costs are declining in the local exchange industry. The cost of certain inputs, such as transmission or switching facilities, may be declining on a per-line or other unit basis due to technological advances. However, the cost of other inputs, such as labor, could well be increasing. As noted above, the fact that the cost structures of small LECs can vary dramatically from those of larger LECs further complicates such analyses.

[56] Indeed, although substantial amounts of relevant data about the largest LECs are available through ARMIS, smaller LECs are not included in the ARMIS database.

III. ANY REGULATORY COSTING METHODOLOGY MUST BE CONSISTENT WITH CERTAIN GENERAL PRINCIPLES

Certain general principles must govern any costing methodology, including the cost studies that LECs have traditionally performed pursuant to regulation. As the Commission staff evaluates the use of cost proxy models in light of the record compiled in this proceeding, these principles should be basic to any methodology that the Commission eventually adopts. Any costing methodology should recognize the regulatory regime to which individual LECs are subject, since, for example, the cost structures of LECs subject to price cap regulation may differ from those subject to rate of return regulation. However, USTA believes that the best approach to these issues is for the Commission to seek ways to rely on the market, rather than regulation, to determine prices for LEC services.

A. Company-Specific Data

The use of company-specific data is a necessary starting point for reasonable results from any regulatory costing methodology. In order to obtain such results, these data are best derived directly from LEC cost studies. As noted above, cost studies would be necessary to develop input information even if cost proxy models were used for costing purposes. Actual cost data, derived from company specific cost studies, are far superior to model outputs for such purposes.

B. Model Validation

The Christensen Attachment underscores the importance of validating any costing methodology, particularly input assumptions.[57] As that Attachment notes, the appropriate values for inputs are likely to vary from company to company and region to region. In addition to input validation, any costing methodology must be validated using an engineering assessment to determine its accuracy in describing an efficient, actual network. However, as the Christensen Attachment points out, cost proxy models in particular will not adequately describe the serving areas of most LECs. This is a particularly important limitation if, as in the Staff Analysis, such models are considered for setting the price levels of access services or unbundled network elements.[58]

C. Existing Wire Center Approach

Consistent with the Staff Analysis, the existing wire center approach is an appropriate basis for costing methodologies.[59] This approach helps ensure a realistic analysis of LEC network designs, as recognized in the Recommended Decision.[60] Moreover, assumed network

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[57] *See* Christensen Attachment at 13-15.

[58] *See id.* at 14-15.

[59] *See* Staff Analysis at paras. 18-21.

[60] *See* Recommended Decision at para. 277.

designs should continue to be based on wireline technologies and network topologies,[61] since those remain the predominant types of networks deployed in the United States.

D. Geographic Unit Of Analysis

The geographic unit of analysis in any costing methodology should permit substantial flexibility for costing purposes, because of the wide variations among the characteristics of LECs' service areas.[62] Existing cost proxy models that use census block groups ("CBGs") pose difficulties for universal service purposes. In particular, the CBG level of granularity is inadequate for many LECs operating in rural areas, precisely where universal service needs traditionally have been the greatest. The geographic unit of analysis for costing purposes other than universal service should be determined by each LEC based on its own situation.

E. Embedded Costs And Technology Mix

As discussed above, embedded costs must be a component of any costing methodology applicable to incumbent LECs.[63] Moreover, any such methodology must reflect the mix of state-of-the-art and mature technologies that is present in each incumbent LEC's existing

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[61] *See* Staff Analysis at para. 21.

[62] *See id.* at paras. 22-23.

[63] *See id.* at para. 47.

network.[64] Of course, this mix can change over time, depending on actual rates of retirement used by incumbent LECs.

F. Capital Costs

The capital costs used in any costing methodology should reflect the realities of competition as it develops.[65] The Staff Analysis cites a 1994 USTA proposal in the Commission's price cap performance review proceeding to use the cost of capital implicit in the U.S. National Income and Product Accounts to compute capital cost in a Total Factor Productivity Study.[66] This approach was designed to develop a national average of capital cost for purposes of developing a nationwide productivity study of price cap companies. Because of the different levels of risk associated with each network investment, the appropriate cost of capital (or "hurdle rate") also varies considerably. Particularly where competition is developing rapidly, use of the authorized return as the hurdle rate for each investment will inevitably result in the LEC earning considerably less overall than that authorized return.[67]

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[64] *See* Christensen Attachment at 7-9.

[65] *See* Staff Analysis at para. 58.

[66] *See id.*

[67] The FCC has conceded this point, saying that it "agree[s] with USTA, Bell Atlantic, and BellSouth that, as a theoretical matter, the combination of significant sunk investment, declining technology cost, and competitive entry may increase the depreciation rates and cost if capital of incumbent LECs." *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996,* First Report and Order, *supra* note 13, at para. 686.

G. Treatment Of Operating Expenses

In considering operating expenses in a costing methodology, it may be feasible to base estimates of forward-looking costs on book or accounting expenses.[68] However, small LECs may have to use methodologies for doing so that reflect the less comprehensive information available to these carriers compared to larger LECs. For example, small companies may have to adjust book or accounting expenses by a factor reflecting the net effect of inflation and productivity -- that is, usage stimulation. In contrast, a reasonable estimate of forward-looking operating expenses for larger LECs may be based on the historical relationship between expenses and investment.

H. Joint and Common Costs

Joint and common costs[69] must be recovered by LECs under any form of regulation. As competition develops, competitive pressures will help drive the ways such costs are recovered. Modeling is unnecessary to aid in the recovery of these costs.

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[68] *See* Staff Analysis at paras. 64-69.

[69] *See id.* at para. 70.

IV. CONCLUSION

The Common Carrier Bureau is to be commended for requesting comment on the Staff Analysis. Although the interest of the Commission's staff in forward-looking cost proxy models is understandable, such models should not be viewed as a regulatory panacea. Their uses are quite limited, as are the benefits that they would offer regulators and the public. As competition increases in the telecommunications industry, the expenditure of scarce regulatory resources on developing models for such purposes as price regulation will be a futile exercise, since the market ultimately will enforce efficient pricing.

USTA thus submits that a broader view of the telecommunications environment than that of the Staff Analysis is necessary. Such a view should seek ways to rely on the market, rather than regulation by cost model, to determine prices for LEC services. It should also expressly recognize that LECs have incurred costs under franchise monopoly regulation that should be recovered in their rates.

Respectfully submitted,

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Appropriate Standards for Cost Models and Methodologies

Christensen Associates
February 13, 1997

Introduction

On January 9, 1997, members of the FCC staff ("Staff") issued an analysis to stimulate discussion on the criteria for the evaluation of forward-looking proxy cost models.[1] Currently, such models are being considered in various FCC proceedings as a tool for determining universal support payments, access rate restructuring, and unbundled network element pricing. We have been asked by the United States Telephone Association to respond to issues raised in the Staff analysis.

We focus on responding to Section III of the Staff Analysis. In particular, we discuss the appropriate interpretation of forward-looking economic costs, whether a single proxy model is suitable for providing answers to the multitude of issues faced by the FCC, and the validation of proxy models. We conclude the following:

Forward-looking economic costs

- The appropriate interpretation of what constitutes forward-looking economic costs is the expected costs of an actual market participant.
- The common, but incorrect, "blank slate" interpretation of the efficient entrant represents an unattainable static ideal, rather than the achievable performance of an efficient incumbent or entrant.

[1] "The Use of Computer Models for Estimating Forward-Looking Economic Costs," FCC Staff Analysis, January 9, 1997. Hereafter referred to as "Staff Analysis."

Use of proxy models for multiple objectives

- Proxy models may be useful for determining relative cost relationships between high-cost and low-cost areas for purposes of targeting a given universal service fund, but are currently not suitable for determining price levels for unbundled network elements or access services.

- The FCC's inclusion of allocated joint and common costs in economic costs results in a fully distributed cost model that dictates prices. As markets become more competitive, prices will increasingly be determined by market forces, regardless of what is determined by cost models.

Model Validation

- The standardization of input values may bring the statewide average results of the proxy models closer together, but does not indicate how well the models relate to the costs of a dynamically efficient actual firm.

- ARMIS, or similar suitable data provides a good starting point for expenses. The validation of network investments requires an engineering assessment of the network design produced by the models.

- More needs to be done to ensure the accuracy of network designs below statewide aggregates, particularly in lower-density serving areas.

Below, we discuss each of these points in more detail.

II. Use of Forward-Looking Economic Cost as a Basis for Pricing

In paragraph 9 of the Staff analysis, the definition of forward-looking economic costs is provided: "We define forward-looking economic costs as the costs that would be incurred if a new element or service were provided, or that could be avoided if an existing element or service were not provided, assuming

that all input choices of the firm can be freely varied."[2] This definition is essentially one of long-run economic costs with sunk or historically incurred costs excluded. The analysis goes on to assert that prices based on forward-looking economic costs promote efficient resource allocation, providing the correct market entry and exit decisions.

Finally, in paragraph 9, Staff asserts "We also believe that this view is consistent with the Joint Board's conclusion that basing universal service support levels on the forward-looking economic costs of an efficient carrier will preserve and advance universal service by providing carriers with the correct signals for entry, investment, and innovation."[3] The economic criteria spelled out by the Joint Board are based on forward-looking economic costs to determine the cost of providing universal service:[4]

> "We find that forward-looking economic costs should be used to determine the cost of providing universal service. Those costs best approximate the costs that would be incurred by an efficient competitor entering the market. We believe that support should be based on the cost of an efficient carrier and should not be used to offset the cost of inefficient provision of service or cost associated with services that are not included in our definition of supported services, such as private lines, interexchange service, and video services."

Most economists would agree with these general principles. However, implementing these principles raises a number of fundamental questions. First,

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[2] Staff Analysis, p. 4.
[3] Staff Analysis, p. 4.
[4] Federal-State Board on Universal Service, CC Docket 96-45, Recommended Decision, November 8, 1996, para 270.

while Staff's definition comports with the generally accepted definition of incremental costs, the FCC has previously indicated that "economic costs" include both incremental costs and a portion of forward-looking joint and common costs.[5] At the very least, this creates ambiguity in Staff's definition—does Staff's definition of economic costs include incremental costs only, or does it also include some allocation of joint and common costs? As discussed below, if Staff's definition of economic costs is intended to include allocations of joint and common costs, any model constructed according to this definition is a pricing model that will be of limited usefulness in increasingly competitive markets.

Second, no time frame is associated with the models or costs. A simple question in this area is how long the costs are good for—one year, two years or more? As telecommunications markets evolve, as envisioned by the 1996 Telecommunications Act, the structure of firms and their costs are likely to evolve. Therefore, the inputs, assumptions and methods of a cost model must be flexible to adapt to the changing marketplace.

Third, a key issue in guiding the development of cost models is the interpretation of what constitutes forward-looking economic costs, regardless of whether they relate to incremental or joint and common costs. The appropriate interpretation is the expected costs of an actual market participant.

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[5] See First Report and Order, CC Docket 96-98, August 1, 1996, para 675.

As we pointed out in our previous analysis of proxy cost models,[6] a common, but incorrect, interpretation of this principle is that the entrant will provide the full array of services currently provided by the incumbent LEC, but the entrant has no sunk investment and therefore is not constrained by past decisions in its network investments—i.e., the entrant starts with a "blank slate" and instantaneously constructs a network with the capacity to accommodate all of the incumbent's customers. This interpretation of the efficient entrant represents an unattainable static ideal, rather than the achievable performance of an efficient incumbent or entrant. Actual incumbents or entrants will generally deviate from this hypothetical static standard because of uncertainty, the capital intensive nature of the telecommunications industry, and its rapid rate of technological change. Therefore, holding actual firms to this hypothetical standard will lead to an under-recovery of costs by an efficient incumbent.

The capital-intensive nature of the telephone industry and its rapid rate of technical progress create cost differences between an efficient incumbent and the incorrectly defined hypothetical entrant that would instantaneously supply the entire market. Investments must be made based on expectations of customer demand, input prices, and technologies available. After the investments are made, because of uncertainty, actual customer demands, input prices, and technologies will differ from the expectations and, thus, investment that is optimal

[6] "Economic Evaluation of Proxy Cost Models for Determining Universal Service Support," Christensen Associates, January 9, 1997.

based on prior expectations will deviate from optimality after the investments are made.

Furthermore, an actual firm, whether it is an incumbent or actual entrant, may be efficient in a dynamic sense but not efficient in the idealized static sense. A dynamically efficient firm will fall short of the static efficiency standard set by the hypothetical instantaneous entrant. For example, take the case of an area that is ultimately served with capacity of 1,200 pairs of copper cable. The static model would immediately place a 1,200 pair cable to satisfy this capacity. However, a dynamically efficient actual firm may arrive at the 1,200 pair capacity over time with, for example, a series of four discrete placements of 300-pair cables. Similarly, an actual entrant, behaving in a dynamically efficient manner would not instantaneously construct a network to serve all the incumbent's customers. Among the factors the dynamically efficient firm would consider in making these discrete placements over time would be: the expected growth in demand; the cost of placing the cable all at once versus the cost of multiple placements over time; and the carrying charge associated with having a period of excess capacity until demand grows into the cable.

Technical change in the industry will also create a situation where the incumbent carrier provides service using both old and new technologies. In contrast, the hypothetical statically efficient entrant, with instantaneous creation of a new network, will employ only the new technology. It would obviously not be cost effective for the incumbent to replace all of its plant as each new technology

becomes available. Rather the incumbent makes an economic comparison between continued use of the previously installed older technology and the installation and use of the new technology. At the point where the new technology becomes cost effective, the incumbent begins the process of replacing the older plant with the new technology. However, this change-over is not instantaneous; it occurs at an economically feasible rate for the incumbent. It should also be noted that once a facilities-based entrant is in the market, it also faces the same type of constraints in adopting new technologies.

In an industry with high fixed costs and rapid technological change, the "blank slate" interpretation of static efficiency imposes significant revenue recovery risk upon incumbent firms. This is because the incumbent will incur actual costs that are based on a mixture of existing and new technologies, rather than exclusively on forward-looking, least-cost technologies. This occurs even if the incumbent is behaving perfectly efficiently.

Examples from the economic literature support the view that the appropriate basis for determining forward-looking economic costs (and, hence, the prices based upon these costs) is the expected costs of an actual firm in the market and not the instantaneous entrant. For example, Taylor asserts that when a new technology is introduced, the relevant economic costs are based on a mixture of the existing and new technologies because: [7]

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[7]William E. Taylor, "Efficient Pricing of Telecommunications Services: The State of Debate," Journal of Industrial Organization 8, 1993, p. 25.

> "... the network will not be rebuilt from scratch, and the very long long-run view of costs identified above is not appropriate for pricing. The cost that a customer's action imposes on the network is the cost of the most efficient response to that action, given the network as it exists today....Forward-looking loop costs are not the incremental costs of the longer loops that would be optimal with a digital switch (if the network were fully re-optimized to account for higher usage and digital switches) but rather the incremental costs for the loops that will actually be installed in the future."

Taylor goes on to state that the "...forward-looking efficient pricing requires users to pay the costs they actually impose on the network, not the costs they would have imposed had a more efficient network been put in place."[8]

In his seminal article on marginal cost in the highly regarded Economic Journal, Turvey notes that at any point in time, the costs of a firm or industry represent a mixture of plant vintages and that costs derived from replacing the industry from scratch are irrelevant:[9]

> "New plants reflect current technology and changing relative factor prices and will be built when price exceeds their average total costs. The oldest plants are scrapped when they fail to cover their operating costs. In between come a whole range of plants of various vintages. Thus the cost structure of the industry in any year depends upon the past evolution of its gross investment, its technology and relative factor prices.
>
> This brings out the general irrelevance of the traditional long-run average-cost curve for the whole industry. Such a curve shows what costs would be at various alternative levels of output if the industry were built from scratch using to-day's technology and minimising costs at to-day's relative factor prices. This is clearly irrelevant in most cases."

This passage states that the appropriate cost recovery target should be

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[8] Taylor, p. 31.
[9] Ralph Turvey, "Marginal Cost," The Economic Journal, June 1969, pp. 285-286.

the firm's or the industry's total costs, as they are computed from the various plant vintages, and not costs based on a hypothetical firm or industry built from scratch.

In a January 14, 1997 letter to FCC Chairman Reed Hundt, Professor Alfred E. Kahn responded to a December 2 letter by five former Department of Justice Economists who declared their support for TELRIC-based pricing. Professor Kahn declared he was in "fundamental disagreement" with them for a number of reasons. One of the fundamental disagreements Professor Kahn has is the interpretation of economic costs as being developed from a "blank slate" versus the actual expected costs of an existing firm: Professor Kahn argues that the appropriate standard is the costs that will actually be incurred, not those of a hypothetical entrant who instantaneously builds its capacity from a "blank slate."[10]

The idealized statically efficient entrant interpretation does not represent the performance of an actual entrant or incumbent who is dynamically efficient.

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[10] Letter from Alfred E. Kahn to Reed E. Hundt, January 14, 1997. From pages 1 and 2 of Professor Kahn's letter, he says the following about the appropriate cost standards to apply:

> "The general economic principle that they cite clearly requires, however, that the correct pricing 'signals' inform consumers of the costs that society will actually incur if they take somewhat (or a lot) more of each good or service.
>
> Advocates of the 'blank slate' version of TELRIC typically assume that that is the level to which competition would drive price, if it were effective. They are mistaken. In a world of continuous technological progress it would be irrational for firms constantly to update their facilities in order completely to incorporate today's lowest-cost technology, as though starting from scratch: investments made today, totally embodying today's most modern technology, would instantaneously be outdated tomorrow and, in consequence, never earn a return sufficient to justify the investments in the first place."

Actual entrants and incumbents, who are dynamically efficient, will generally deviate from this ideal because of uncertainty, the capital intensive nature of the telecommunications industry, and its rapid rate of technological change. Therefore, if rates were strictly based on the cost levels produced from models adhering to the idealized standard of instantaneous static efficiency, cost recovery problems would be created for both incumbent LECs and actual market entrants. Moreover, as Professor Kahn notes, adopting a "blank slate" approach will actually discourage facilities-based competition in contrast to the FCC's goals:[11]

> "In either event, the Commission's prescription reflects a presumption all too typical of regulators—declaring, in effect, 'we will determine not what your costs are but what they ought to be.' That approach has two major defects: first, that is not how the competitive process works; and second, its prices would actually discourage competitors coming in and building their own facilities when that would be more efficient than using the incumbent's facilities...."

Finally, it is somewhat of a paradox that the telephone industry, which has been at the forefront of technological innovation over the years, would be held to this hypothetical static efficiency standard. Our productivity studies, as well as those of others, have shown that the telephone industry has consistently surpassed most other industries in its rate of productivity growth.[12] If any

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[11] Kahn letter, p. 2.

[12] Most productivity studies of the telephone industry have focused either on the Bell System (pre-1984), or Bell Operating Companies and other Tier 1 LECs (post-1984). For example, see Laurits R Christensen, Philip E. Schoech, and Mark E. Meitzen, "Productivity of the Local Operating Telephone Companies Subject to Price Cap Regulation," Christensen Associates, May 3, 1994; _____ "Total Factor Productivity Methods for Local Exchange Carrier Price Cap Plans," December 18, 1995. A review of other telephone industry TFP studies can be found in Prepared

industry represents a model of dynamic efficiency, it would be the telephone industry. Therefore, the costs that are expected to be incurred by incumbent providers would provide a good benchmark to assess the forward-looking economic costs for telecommunications providers.

III. Use of Proxy Models for Multiple Objectives

In paragraph 11, Staff states that it is not clear whether a single proxy model, or combination of models, can or should be used to achieve multiple regulatory objectives, such as access rate restructuring, universal service support levels, and unbundled network element pricing.[13]

Proxy models were initially developed to identify high-cost areas for universal service funding purposes and have evolved into multiple-use models. While proxy models may be useful for determining relative cost relationships between high-cost and low-cost areas for purposes of targeting a given size universal service fund, their suitability for determining cost levels for network elements or services, such as access, is limited.[14] This is because the information requirements to develop company-specific or geographic-specific costs for network elements or services is much greater than can be developed from the broad, publicly-available data sources used by the proxy models. At the

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Testimony of Laurits R. Christensen, Public Utilities Commission of the State of California Investigation No. 95-05-047, September 8, 1995.

[13] Staff Analysis, p. 5.

[14] As noted below, to date proxy models have not adequately modeled low density areas served by any telcos. Therefore, the ability of the models to identify high-cost areas is currently limited. This is particularly true of the Hatfield model, which has only modeled Bell-served territories.

very least, company or area-specific inputs are required to accomplish this task.

Moreover, the efficient design of actual networks in specific geographic locations is likely to vary from those generated by the broad assumptions contained in the proxy model network designs. Again, this makes it very difficult for generic proxy models to adequately capture the true cost characteristics of efficiently-designed actual networks that are needed to establish cost levels.

A "one-size-fits-all" proxy model is also of limited use because the network design and input assumptions of the model will likely vary depending on the particular application. For example, in a universal service application, the model will construct a network to provide supported services to business and residential customers. The design and input assumptions for this type of network are likely to differ from those of a model to be used for costing unbundled network elements or access services. Differences may occur, for example, in the amount of fiber versus copper to install, switching hardware and software choices, and the inclusion (or exclusion) of certain expenses, such as customer services and marketing expenses. Without the appropriate consideration of these and other design issues and assumptions, there is great potential for misuse of proxy models.

Finally, another limitation of proxy models for use in unbundling or access reform applications is the relationship between costs and prices in competitive markets. As we noted above, the FCC has interpreted economic costs to include

a "reasonable" allocation of joint and common costs.[15] Thus economic costs developed according to this interpretation, whether they come from a proxy model or any other cost model, will essentially dictate prices. In other words, using the FCC's interpretation of economic costs results in a forward-looking fully distributed cost model where prices are based on allocations of forward-looking economic costs. As these markets become more competitive, prices will increasingly be determined by market forces, regardless of what is determined by cost models.

[15] Supra, fn. 5.